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By Messenger

William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: CC Docket No. 92-297, RM-7872, RM-7722
Ex Parte Presentation

Dear Mr. Caton:

The enclosed written materials were delivered today to Mr. Thomas Tycz and the other Commission representatives listed thereon.

An original and four copies of this letter are enclosed.

Respectfully submitted,

John P. Janka

Enclosures

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Via Messenger

Thomas S. Tycz
Chief, Satellite and
Radio Communication Division
International Bureau
Federal Communications Commission
2000 M Street, NW, Room 811
Washington, D.C. 20554

Re: CC Docket 92-297
28 GHz Spectrum Band Plans

Dear Mr. Tycz:

I am writing on behalf of Hughes Communications Galaxy, Inc. ("Hughes") to provide you with a written summary of Hughes's views on the 28 GHz band plan proposals currently being considered by Commission Staff.

Hughes is very pleased that it has come to a mutually acceptable understanding with TRW with respect to sharing the 29.25-29.4 GHz band between the Galaxy/Spaceway system and Odyssey. Hughes has long been an advocate of sharing spectrum between GSO FSS and NGSO MSS feeder links, where technically feasible, and our understanding with TRW is a culmination of much hard work and analysis on both sides. In light of this understanding and subject to the important limitations set forth below, Hughes is now able to fully endorse the 28 GHz band plan proposed in the July 1995 Third Notice in this proceeding, and as described in varying iterations as Option 1, 2, 2A, or 2B in our recent status conferences. (Copies of materials describing these options are attached).

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February 6, 1996

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OFFICE OF SECRETARY

Thomas S. Tycz
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It is significant that our solution with TRW now allows implementation of the band plan proposed last summer. As indicated at yesterday's meeting, the GSO industry, which includes Hughes, AT&T, Lockheed, GE, Loral, and others universally agreed that "Option 3" (which would provide only 875 MHz to the GSO FSS service) is unacceptable because of the significant constraints it would impose. Our new understanding with TRW obviates any further need to consider that Option as a solution.

Moreover, it would be fundamentally unfair to adopt Option 3 as a solution, and thereby penalize TRW and GSO FSS proponents for having engineered a sharing solution, when the only the remaining problems that exist in this proceeding involve LMDS sharing with NGSO satellite systems. Instead, we urge the Commission to pursue implementation of its current 28 GHz band plan proposal by requiring other sharing combinations, such as the LMDS/NGSO MSS and LMDS/NGSO FSS gateway combinations that are contained in Options 2, 2A and 2B that we discussed yesterday.

We do need to emphasize that our understanding with TRW is a carefully crafted compromise that is based on three fundamental assumptions about the rest of the 28 GHz band plan. Adverse changes with respect to any of these assumptions would likely disrupt the balance that we have struck and render our arrangement unworkable.

1. GSO FSS Retains Access to 1000 MHz of the Ka Band

First and foremost, it is critical that GSO systems retain access to 1000 MHz of Ka band spectrum. Our sharing agreement with TRW imposes certain limitations on the Galaxy/Spaceway system, but it is a far less burdensome constraint than having access to only 875 MHz, as "Option 3" would provide. Our requirement for 1000 MHz comes from a number of factors.

Access to 1000 MHz is a business case requirement for the low-cost, mass-market Galaxy/Spaceway design, because the amount of available spectrum affects spacecraft capacity, the number of subscribers we can support, and, indirectly, the cost of the ubiquitous receive equipment. The types of interactive broadband services that we envision for the Ka band will require access to at least as much spectrum as is currently provided today at C and Ku band, where hybrid satellites typically utilize 1000 MHz at a single orbital location. Outside the United States, GSO FSS systems will continue to enjoy access to over 1.6 GHz of Ka band spectrum and Hughes anticipates fully utilizing at least that much bandwidth at numerous locations around the world.

In 1993, given the competing proposals of LMDS, GSO FSS and NGSO MSS for the Ka band, we recognized that it was highly unlikely that GSO FSS would be able to retain access to more than 1000 MHz of the Ka band in the U.S. For that reason, and in an

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effort to facilitate a prompt resolution of the 28 GHz proceeding, we designed a system that would support the projected subscriber base by using 1000 MHz at each of two adjacent orbital locations. That design left 1.5 GHz of the band available for LMDS and NGSO MSS feeder links, but the subsequent introduction of the Teledesic proposal has greatly complicated the sharing situation.

Through all of this (and unlike some other Ka band proponents), Hughes's spectrum requirement in the U.S. has not increased from its initial request for 1000 MHz. As we have stated throughout this proceeding, 1000 MHz is our bottom line requirement. GSO spacecraft already "lose" 5-15% of their assigned spectrum through coordination with 2 degree adjacent GSO systems, and our coordination arrangement with Odyssey will further affect GSO system performance through decreased link performance and a reduction in available capacity in the beams shared with Odyssey.

Stated differently, Hughes bears a number of performance "hits" as a result of sharing with other GSOs and the new sharing arrangement with Odyssey. In addition, the GSO FSS frequency and polarization limitations inherent in the Odyssey sharing solution constrain future GSO system designs. Any further reduction in GSO spectrum would significantly impact our business case and call into question the viability of the Galaxy/Spaceway system in the United States.^{1/}

In addition, as we described to you in our January 26, 1996 ex parte presentation, the current Galaxy/Spaceway design is integrally tied to access to 1000 MHz. Hughes has spent millions of dollars on research and development for this system, which is based on-board processors whose maximum capacity is 500 MHz, the need to have an on-orbit redundant satellite that has access to another 500 MHz, and a highly efficient frequency reuse scheme that uses multiple spot beams of 125 MHz of contiguous spectrum each. Any changes in this design will result in schedule delays, increased costs and possible missed market opportunities.

2. GSO FSS Shares Only with TRW/Odyssey

As we indicated in yesterday's status conference, this is a solution that applies only to one specific NGSO MSS system: Odyssey. The characteristics of the Odyssey

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1. In particular, access to less than 1000 MHz in the U.S. would further disadvantage the design of a U.S. system vis-a-vis a similar system over a foreign country which will have access to at least 1.6 GHz.

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system that make this solution possible include the relatively few spacecraft (12) in the Odyssey system, and the fact that TRW uses predictable, repeating ground tracks.

Our arrangement with TRW could form the basis for coordination discussions with other, future NGSO MSS systems, but it simply is not possible at this time to address whether that solution will work with another, yet undefined, NGSO MSS system. We are willing to try to develop NGSO MSS/GSO FSS sharing rules that are based on our sharing principles with TRW and that would apply to future NGSO MSS systems, and we would be pleased to work with Commission staff on those rules.

Most important, we need to emphasize that our sharing arrangement with Odyssey is not applicable to Iridium. The reason is that the Iridium architecture does not include the elements described above that make this method of sharing applicable. Our proposal therefore is based on the premise that there will be no spectrum overlap between the Iridium system and the Galaxy/Spaceway system. In other words: Iridium would be limited to using 150 MHz at 29.1-29.25 GHz band for uplinks.

3. GSO FSS/NGSO MSS Downlink Separation is Required

This solution requires that GSO FSS downlinks be separated in frequency and polarization from the NGSO MSS downlinks. We have no basis at this time for expanding the uplink solution to the downlink side, although that may be possible in the future. Thus, assuming that the NGSO MSS feeder links are using the 19.3--19.7 GHz downlink band, GSOs would need to be provided the flexibility to use alternate downlink spectrum to pair with the 29.25-29.5 GHz uplinks. Since LMDS is proposed to have primary access to the 27.5-28.35 GHz band, the corresponding 17.7-18.55 GHz downlink band should be made available as an alternative primary GSO FSS downlink band.

As we have noted in our Reply Comments in this proceeding, use of alternative (or "non-standard") downlink spectrum does impose a number of constraints on GSO systems. First, from a design standpoint, a "standard" transpondered satellite becomes more complex and costly when it uses a non-standard downlink band. This is a cost penalty that we are willing to accept in the spirit of compromise. Second, since there are a number of other services in the GSO FSS downlink bands that may restrict GSO FSS use of those bands, GSOs need the flexibility to use any part of this 850 MHz of alternate spectrum that is most appropriate for their system design. As the Commission is aware, the 17.7-17.8 GHz band is now used in the US today for DBS feeder link stations, and WARC-92 allocated the 17.8-18.4 GHz band for DBS feeder links as well. That use could affect the suitability of parts of the 17.7-18.4 GHz band for GSO FSS downlinks. In addition, the 18.55-18.8 GHz downlink band that the FCC is proposing to assign to GSO FSS is "tainted" by power

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limits that have been imposed to protect the Space Sciences and that may be further restricted at WRC-97.

* * *

In conclusion, we would like to thank you and the Staff for holding the recent series of status conferences. Those meetings have helped to sharpen the issues and have been instrumental in encouraging parties to work out solutions to some of the challenges we all face in this proceeding. We look forward to a prompt resolution of this proceeding so that all parties may begin to pursue their business plans.

Sincerely yours,

John P. Janka

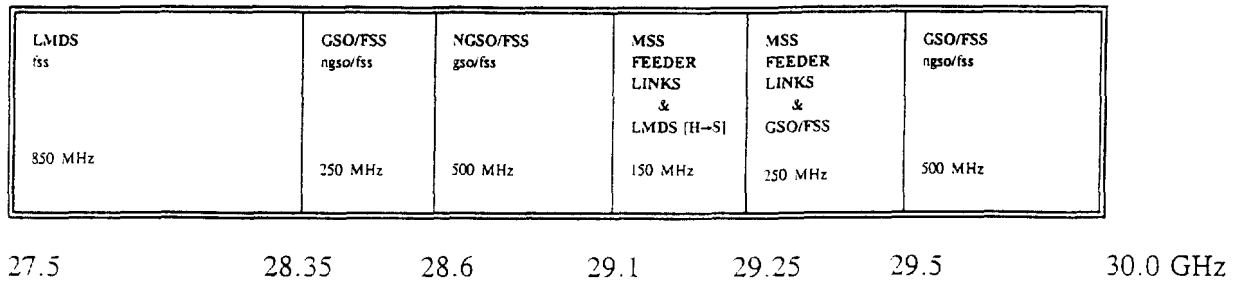


Enclosures

cc: Chairman Reed E. Hundt
Commissioner James H. Quello
Commissioner Andrew C. Barrett
Commissioner Susan Ness
Commissioner Rachelle Chong
Ms. Michelle Farquhar
Ms. Jennifer Gilsenan
Mr. Donald Gips
Mr. Robert James
Mr. Karl Kensinger
Ms. Susan Magnotti
Dr. Michael Marcus
Mr. Harry Ng
Dr. Robert Pepper
Mr. Gregory Rosston
Mr. David Wye

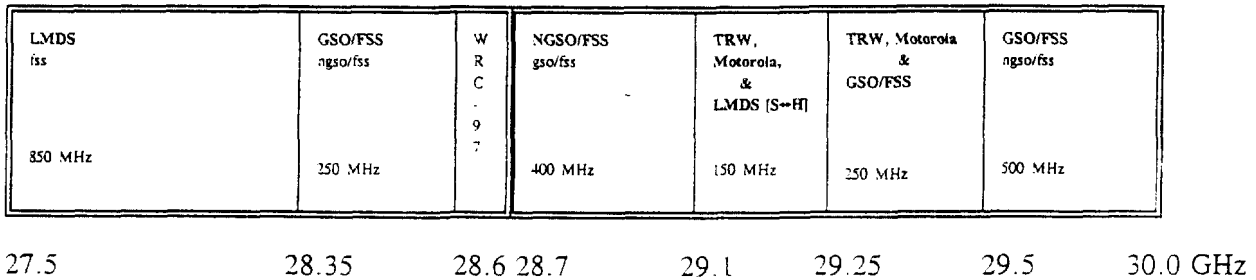
Band Plan Options for the 28 GHz Band

Option 1: Band plan proposed in the Third NPRM.



- LMDS subscriber transceivers would not be able to transmit in the band shared with feeder links.
- TRW would operate on a reverse band basis. Sharing criteria necessary between feeder links for the 2 MSS systems at 19 GHz.
- First come first served protection in the 29.25-29.5 band segment.

Option 2: More Extensive Sharing Requirements



- Rules for sharing between Motorola and LMDS so that LMDS can transmit from subscriber to hubs in the shared portion of the bands. (See Attached).
- Rules for sharing between TRW and Motorola i.e., geographical separation of gateway earth stations at distances to be determined by the FCC between approximately 200 and 800 kilometers.
- Rules for sharing between 2 MSS feeder link systems and GSO systems.

Option 3:

Staff Band Segmentation Adjustment

LMDs fss	GSO/FSS ngso/fss	W R C - 9 7	NGSO/FSS gso/fss	Motorola & TRW	TRW & LMDs (S-P)	GSO/FSS ngso/fss
850 MHz	250 MHz		400 MHz	150 MHz	125 MHz	625 MHz

27.5 28.35 28.6 28.7 29.1 29.25 29.375 30.0GHz

- 40 kilometer coordination zone around 2 U.S. TRW sites. In this zone, LMDs accepts interference or undertakes mitigation efforts consistent with TI's proposal for subscriber to hub operations.
- Sharing criteria for Motorola and TRW (Same as Option 2).

Option 2 A

HUGHES
COMMUNICATIONS

WRC '97

LMDS fss 850 MHz	GSO/FSS ngso/fss 250 MHz	NGSO/FSS gso/fss 400 MHz	LMDS MSS FL (Iridium & Odys) 150 MHz	GSO/FSS MSS FL (Odyssey) (150 MHz) 250 MHz	GSO/FSS ngso/fss 500 MHz
27.5	28.35	28.6 28.7	29.1	29.25	29.5
					30.0

- TRW/Odyssey and GSOs share 150 MHz without Iridium in same band
- TRW/Odyssey share 150MHz with Iridium
- Iridium and LMDS share 150 MHz
- Teledesic has conditional 400MHz without need to share and potential additional 100MHz allocated at WRC '97
- All get BW needed but LMDS must share with Iridium

Option 2 B

HUGHES
COMMUNICATIONS

WRC '97

LMDS	GSO/FSS	L M D S	NGSO/FSS	MSS FL (Iridium &Odys)	GSO/FSS	GSO/FSS
fss	ngso/fss		gso/fss		MSS FL (Odyssey) (150 MHz)	ngso/fss
850 MHz	250 MHz	100 MHz	400 MHz	150 MHz	250 MHz	500 MHz
27.5	28.35	28.6 28.7		29.1 29.25	29.5	30.0

- **LMDS return links moved to 28.6 to 28.7 GHz**
- **LMDS sharing with NGSO FSS (Iridium) avoided**
- **Teledesic BW constrained to 400 MHz - WRC '95 conditional allocation**
- **LMDS has 25 MHz less BW than option 3 – but clear**
- **All others stay the same – reduces sharing requirements on Iridium and Odyssey**